United Nations A/55/99-E/2000/86

General Assembly
Economic and Social Council

Distr.: General
30 June 2000

Original: English

General Assembly
Fifty-fifth session
Item 97 of the preliminary list*
Environment and sustainable development

Economic and Social Council
Substantive session of 2000
New York, 5 July-1 August 2000
Item 13 (a) of the provisional agenda**
Economic and environmental questions: sustainable development

International cooperation to reduce the impact of the El Niño phenomenon

Report of the Secretary-General

Summary

The present report has been prepared pursuant to General Assembly resolution 54/220. It builds on previous reports of the Secretary-General on this topic (A/53/487 and A/54/135-E/1999/88). It reviews the context of the El Niño phenomenon (sect. I), ongoing activities (sect. II) and future arrangements for the Inter-Agency Task Force on El Niño (sect. III), and provides recommendations (sect. IV). An annex, prepared with the support of the World Meteorological Organization, concerns country and agency reviews on the impacts of the 1997/98 El Niño event.

* A/55/50.
** E/2000/100.

00-51342 (E) 190700

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I. Context

1. The term El Niño, although not rigorously defined, is associated with a major warming of the surface layers of the central and eastern equatorial Pacific Ocean. An El Niño event occurs when warm water flows eastward from the warm pool of the western tropical Pacific Ocean and there is a reduction in upwelling of cold water in the eastern equatorial Pacific Ocean and along the Pacific coast of the Americas. Once initiated, an El Niño event typically lasts about a year, although climate anomalies in some parts of the globe may persist longer. Such an event occurred during much of 1997 and faded rapidly around mid-1998. This event is generally recognized now to have been one of the most intense and devastating in recorded history, although in a number of locations, notably in Southern Africa and Australia, its impacts were not as severe as the previous severe event of 1982/83.

2. The dramatic changes in weather and climate patterns across the Pacific Ocean associated with El Niño are one extreme of what is referred to as the Southern Oscillation, and the overall coupled ocean-atmosphere processes are referred to as El Niño Southern Oscillation (ENSO). The other extreme of the Southern Oscillation is associated with colder than normal waters over the eastern equatorial Pacific Ocean and a piling up of warm waters in the west, and is referred to as a La Niña event. The two extremes are often referred to as the warm phase and cold phase, respectively, of ENSO, indicating that they appear to be part of a single phenomenon.

3. The shifting of seasonal weather patterns that was triggered by the 1997/98 El Niño event produced climate extremes over many parts of the globe, often with major socio-economic impacts. More than 24,000 lives were lost because of high winds, floods or storm tides that occurred during intense storms. In addition, some 110 million people were affected, including more than 6 million people who were displaced as community infrastructures, including housing, food storage, transport and communications, were lost during storms. The direct value of losses exceeded US$ 34 billion. While waterlogging of fields led to reduced agricultural production in many parts of the world, in other regions the absence of the usual seasonal storms and rains led to prolonged dry spells, loss of crops and reduction in water supplies. Further, increased incidence of disease occurred due to the prolonged disruption to weather and rainfall patterns that resulted in contamination of water supplies and a more favourable environment for disease-carrying insect vectors.

4. The intense 1997/98 El Niño event was rapidly replaced by La Niña conditions, which set in during the latter half of 1998, prevailed through 1999 and continued into 2000. This La Niña phase appears to have brought its own set of disasters in many areas of the world; however, a thorough analysis such as that carried out on the preceding La Niña phase has not been carried out. There is considerably less confidence at this stage, therefore, in attributing recent incidences of drought and flood, such as the extensive flooding in Mozambique, solely to ENSO.

5. The 1997/98 El Niño event clearly demonstrated useful and developing capabilities in the areas of climate monitoring and prediction. However, gaps in knowledge of the climate system and monitoring coverage and the early stage of development of climate forecasting models indicate the potential for significant improvement.

6. In response to General Assembly resolution 52/200, the Inter-Agency Task Force on El Niño was created in December 1997 within the framework of the International Decade for Natural Disaster Reduction (IDNDR). The General Assembly welcomed its establishment for cooperative work between member agencies and their partner agencies outside the United Nations system. The Task Force provided a platform for combining efforts to improve understanding of the El Niño phenomenon, for disseminating early warnings prior to the events and for channelling technical assistance and capacity-building resources to Member States threatened or affected by El Niño/La Niña-related disasters.

7. In pursuance of General Assembly resolution 52/200 and with the generous support of the Government of Ecuador, the Inter-Agency Task Force on El Niño and the Permanent Commission for the South Pacific convened the first global assessment of the 1997/98 El Niño event. An international seminar was held in Guayaquil, Ecuador from 9 to 13 November 1998, which provided a substantive interface between the scientific and technological constituencies and their operational partners in disaster prevention, humanitarian disaster management and

operational development. Experience with the 1997/98 El Niño event demonstrated once again the potentially devastating effects of El Niño-related climate extremes on the sustainable development efforts of developing countries, where most of the socially damaging impacts occur.

8. The Guayaquil seminar provided the opportunity for IDNDR to commission a thorough scientific and technical analysis of the 1997/98 El Niño event. This analysis was prepared by the World Meteorological Organization (WMO), with financial and technical support from the United Nations Environment Programme (UNEP), the Intergovernmental Oceanographic Commission (IOC) of UNESCO and the International Council of Scientific Unions (ICSU). The report was published just prior to the fifty-fourth session of the United Nations General Assembly. Also stimulated by the Guayaquil meeting was a project to assess the impact of the El Niño event on 16 developing countries around the world. This project was initiated with support from the United Nations Fund for International Partnerships (UNFIP).

9. The closing stages of IDNDR provided a number of opportunities to assess the efforts carried out so far by the international community to reduce the impact of the ENSO phenomenon. For example, an IDNDR programme forum, held in Geneva from 5 to 9 July 1999, convened a panel on the theme: "Climate variabilities and extremes: El Niño, La Niña". The ENSO phenomenon was discussed at several other international forums, as well.

10. The seventh session of the Commission on Sustainable Development requested the Secretary-General to gather information on all aspects of the impact of ENSO, through national reports on the implementation of Agenda 21, and to provide this information to the Inter-Agency Task Force on El Niño. This information would provide a base for the development of an international comprehensive strategy towards the assessment, prevention, mitigation and rehabilitation of the damage caused by ENSO.

11. At the fifty-fourth session of the General Assembly, the Secretary-General submitted a report on international cooperation to reduce the impact of the El Niño phenomenon (A/54/135-E/1999/88), as requested in General Assembly resolution 53/185. The General Assembly, in its resolution 54/220, noted with appreciation the efforts made to reduce the impact of natural disasters related to the El Niño phenomenon through improved scientific understanding, close monitoring and the dissemination of timely forecasts to communities affected, in particular the efforts of the Inter-Agency Task Force on El Niño, in close cooperation with member agencies of the Inter-Agency Committee on the Climate Agenda.

12. The Climate Agenda is the organizational framework under Agenda 21 for coordinating international climate activities and for further developing regional and global infrastructures for understanding of the climate system. The agencies and programmes that make up the Climate Agenda provide the scientific and technical capability necessary to support a global, multidisciplinary approach to reducing vulnerability, building resilience and mitigating the negative impacts of climate extremes and for the promotion of sustainable development. Co-sponsors of the Climate Agenda are relevant agencies of the United Nations, led by WMO, and non-governmental bodies led by ICSU. The four pillars of the Climate Agenda for addressing global climate issues are: dedicated observations of the climate system; new frontiers for climate science and prediction; studies of climate impact assessments and response strategies to reduce vulnerability; and climate services for sustainable development.

13. IDNDR came to a close in December 1999. As a successor arrangement to IDNDR, the Secretary-General established an inter-agency task force and an inter-agency secretariat for disaster reduction under the direct authority of the Under-Secretary-General for Humanitarian Affairs. The International Strategy of Disaster Reduction (ISDR) was established in Economic and Social Council resolution 1999/63 and General Assembly resolution 54/219; since January 2000, steps have been taken to implement those resolutions. The ISDR Task Force will assess trends of risk from natural, environmental and technological hazards, and will assess the relevance of risk reduction in relation to existing and/or emerging strategic domains of the United Nations system.

14. The ISDR Task Force will also provide platforms for action by establishing thematically specific ad hoc working groups, which relate to strategic domains, such as ENSO, early warning and the quantification of risk, and the vulnerability and impact of disasters. Such ad hoc working groups would be chaired and coordinated by the ISDR Task Force member entity

most concerned with regard to existing or evolving mandates. Within their areas of specific concern, the ad hoc working groups would develop proposals for concrete (model) activities, which involve the respective constituencies at large. They will also work out specific action plans on the implementation of such activities.

II. Ongoing activities

15. In accordance with its lead role on science and technology in the Inter-Agency Task Force on El Niño, WMO embarked on a feasibility study for an international centre for the research of the El Niño phenomenon in Guayaquil, as requested in the Declaration of Guayaquil. The study began with a WMO mission to Ecuador from 27 January to 7 February 1999.

16. The proposed centre has the full support of the Government of Ecuador and the national and regional institutions with which it would cooperate, and tangible support is also expected from the wider international climate science constituency. The centre would have two main functions: to promote and undertake research on the ENSO phenomenon and mathematical modelling to permit "downscaling" of global climate predictions to regional and national scales; and to provide outreach services to the community of users of ENSO data and predictions. The probable annual costs involved would include an estimated US$ 1.1 million from the host country, US$ 300,000 from external resources, and US$ 2.62 million for equipment capital costs.

17. In September 1999, the Inter-American Development Bank and WMO signed an agreement for a study on the prediction and amelioration of socio-economic impacts of ENSO in Latin America and Caribbean countries, which began in March 2000 and will run for 18 months. In the study, the feasibility of early warning systems, including climate prediction on seasonal to inter-annual time scales, will be analysed in selected countries and subregions from the technical, economical, social, environmental, legal and institutional points of view. The study includes an evaluation of the existing institutional and technical forecasting capability in Latin America and Caribbean nations, as well as the formulation of project proposals and the analysis of the economic value of improved early warning systems.

III. Inter-Agency Task Force on El Niño: future arrangements

18. The Inter-Agency Task Force on El Niño, constituted within the framework of IDNDR, recognized the need for and the potential of applying science and technology in this field of climate variabilities to more effectively prevent natural disasters caused by ENSO events. WMO has agreed to take the lead in respect of the science and technology roles of the Inter-Agency Task Force on El Niño, in particular in relation to the understanding, observing and predicting of the El Niño phenomenon and its related meteorological and hydrological impacts.

19. At its fifty-third session, the General Assembly noted, *inter alia*, that any credible strategy for the reduction of the natural disaster effects of future El Niño occurrences must be based on effective dialogue and cooperation between the scientific and technological areas of the United Nations system and its operational responsibilities in the fields of disaster management, humanitarian assistance, sustainable development, technical cooperation and capacity-building, including data collection, monitoring and early warning systems, at all levels.

20. The first meeting of the ISDR Task Force on Disaster Reduction was convened in Geneva from 27 to 28 April 2000. The ISDR Task Force members agreed that it should be regarded as an interdisciplinary forum for advancing disaster reduction, identifying areas of common concern and devising guidelines for the implementation of the Strategy. It was also agreed that ad hoc working groups would be created for areas mandated by relevant General Assembly resolutions or identified by the Task Force as areas of common concern. The working groups would be comprised of a maximum of 10 entities/persons, with a majority being Task Force members. They would start work immediately, with the support of the ISDR secretariat, and would prepare recommendations to be submitted to the ISDR Task Force for endorsement.

21. The working group on El Niño/La Niña was established, under the leadership of WMO, with the participation of the Food and Agriculture Organization of the United Nations, the United Nations Development Programme, the United Nations Educational, Scientific and Cultural Organization, UNEP, the Organization of American States and the South Pacific Applied

Geoscience Commission (SOPAC). Additional members would also be included.

IV. Recommendations

22. The experience gained following the 1997/98 El Niño and subsequent La Niña events have highlighted the need for concerted action among United Nation system partners and counterparts outside the system. The ISDR Task Force working group on El Niño/La Niña, under the leadership of WMO, should take on the role of the former IDNDR Inter-Agency Task Force on El Niño and build on its concrete outputs to date.

23. ISDR activity on ENSO should be linked to other relevant strategic platforms, such as the Climate Agenda and the environmentally related conventions that have emerged from the United Nations Conference on Environment and Development (UNCED), through the United Nations Framework Convention on Climate Change, the United Nations Convention to Combat Desertification in those Countries Experiencing Severe Drought and/or Desertification, particularly in Africa, and the Convention on Biodiversity.

24. Given the inextricable relationships between climate variability, social and economic vulnerability and the effectiveness of early warning systems for natural disasters, it is imperative that functional synergies be created between the various working groups of the ISDR Task Force dealing with these matters.

25. Concrete activities in the domains of advocacy, coordination of action and wide dissemination of information should continue. Such events as workshops to examine the impacts of extreme weather and climate-related events on social and economic activities in the field of agriculture, water resources and human health should be encouraged, especially in developing countries. Forums should also be supported in which the scientific community can interact with user communities on an ongoing basis, providing weather and climate information, to develop approaches for minimizing the adverse effects of expected patterns of climate variability and extremes.

26. Support should be given to the proposed regional ENSO centres, such as the Guayaquil centre. Despite the existence of rich sources of information, data on the ENSO phenomenon has not always been easily interpreted by user communities due to lack of processing and adaptation to their specific needs. The regional ENSO centres could facilitate the distribution of relevant information to users in countries within relatively homogeneous climatic regions, and could promote the best possible utilization of such information to reduce the impact of disasters.

Annex

Country and agency reviews on the impacts of the 1997/98 El Niño event

1. Communities and economies that were affected by the 1997/98 El Niño Southern Oscillation (ENSO) event experienced very different impacts. The United Nations Environment Programme is taking the lead within the framework of the Climate Agenda for coordinating and arranging support for impact assessment studies. A study of 16 countries* affected by the event, which was launched in April 1999 with the participation of the United States National Center for Atmospheric Research, the United Nations University, the World Meteorological Organization and the International Strategy for Disaster Reduction secretariat and supported through the United Nations Fund for International Partnerships, is currently under way.

2. The assessment will review forecasts and impacts of the 1997/98 El Niño, as well as the climate-related early warning and natural disaster preparedness systems in the selected countries in order to improve their ENSO coping mechanisms. Based on the assessment, the project will identify research and policy needs and develop preliminary guidelines for regional and national natural disaster management plans for ENSO warm and cold events and their impacts. The review and assessment will form the basis for:

(a) Identifying policy needs which can then be developed or incorporated into appropriate operational disaster management and research programmes. This would include but would not be limited to needs relating to the potential yet-to-be-identified linkages between ENSO and climate change;

(b) Developing a preliminary set of guidelines for national and regional preparedness for ENSO;

(c) Designing a capacity-building programme for fellowship and training of mid-level resource and sector managers, postgraduate education and outreach to the international academic and scientific community.

3. There will be three major outputs from this study:

(a) Individual country study reports that will explain in some detail the extent to which each country was able to prepare and respond to El Niño-related events as they unfolded and to cope with the after-effects;

(b) A brief for policy makers on the general lessons learned by the 16 countries, with the identification, where possible, of lessons that may be regional or unique but important in nature;

(c) A publication that will highlight the major features of each country study and set down the general cross-cutting lessons to be drawn from the chronology of the event, from the initial detection/forecast through its evolution and its eventual demise.

4. Through an improved understanding of early warning, the project will ultimately contribute to the safety and welfare of people and the environment by enhancing preparedness for the impacts of future ENSO events.

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* Countries participating in the project are: Mozambique, Viet Nam, Ethiopia, Papua New Guinea, Ecuador, China, Philippines, Panama, Fiji, Kenya, Cuba, Bangladesh, Costa Rica, Peru, Paraguay and Indonesia.